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EXPLANATION OF PLATE III.

- Fig. 1. *Nirmus luprepea* K. & C., female.
Fig. 2. *Lipensis comstocki* K. & C., female.
Fig. 3. *Lamobothorium loomisi* K. & C., female.
Fig. 4. *Menopon kuwani* K. & C., female.
Fig. 5. *Menopon alaskensis* K. & C., female.

COCCIDÆ FROM THE GALAPAGOS ISLANDS.

BY S. I. KUWANA,
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(PLATES IV AND V.)

In 1898-1899 Messrs. R. E. Snodgrass and Edmund Heller, assistant in entomology and advanced student in zoölogy, respectively, in Stanford University, spent six months on the Galapagos Island collecting animals and plants for the University. The plants thus collected were placed in the university herbarium, and not until recently were they examined for Coccidæ. During the winter recess, December, 1901-January, 1902, the writer found six species of scale insects on these plants, representing four genera. All of these species are described in this paper. No previous records of Coccidæ from the Galapagos Islands have ever been published.

The following are the names of the species described in this paper: Subfamily Orthezianæ, *Orthezia galapagoensis*, sp. nov.; Subfamily Asterolecaniinae, *Asterolecanium pustulans*; Subfamily Lecaniinae, *Lecanium hemisphaericum*, *Lecanium hesperidum pacificum*, var. nov.; Subfamily Diaspinæ, *Aspidiotus lutanæ*, *Aspidiotus smilacis*.

I have to thank Prof. W. R. Dudley for permission to examine the dried plants, and have also to acknowledge the courtesy of Prof. T. D. A. Cockerell in reading the MS. of this paper, examining specimens of the species herein described, and giving notes, published herewith, on these Galapagos Island Coccidæ.

This paper was prepared in the Entomological Laboratory of Stanford University under the direction of Prof. V. L. Kellogg.

***Orthezia galapagoensis*, sp. nov.** (Plate IV, Figs. 1-4.)

Mature Female.—Antennæ 8-segmented, .76 mm. long, segment 8 longest, then 7, 6, 5, 4, 3 subequal, then 2 and 1, segment 1 being the shortest and thickest. Legs well developed; coxæ wider than long, stout; tibia longer than femur; tarsus one

half the length of the tibia and tipped with a strong denticulate claw, which bears a spine at the base.

The body is an elongate oval, rounded, and covered with fine hairs; anal ring large, bearing six hairs.

The body is coated with a calcareous, laminated secretion. The shape and arrangement of this secretion cannot be given as the specimens were not in good condition. The length of ovisac, about 2 mm., length of insect, 1.6 mm.

Habitat: On *Cordea lutea* (821) and *Scalesia microcephala* (254), Tagus Cove, Albemarle Island.

"This appears to be close to *O. pratonga* Dougl., but the last antennal joint seems to be too long for that species. It cannot be satisfactorily identified without specimens showing perfect lamellæ of the secretion. I think it probable that this is a new species. "*O. ultima* Ckll., from the Argentine Republic, has the waxy lamellæ almost exactly as in the Galapagos species, so far as those of the latter can be seen. The legs and antennæ of *ultima* are much darker than the Galapagos species. The last antennal joint of the Galapagos species is very much longer than in *ultima*, and of quite a different shape. This joint of the Galapagos species is much nearer to *pratonga* than to *ultima*" (Cockerell).

Asterolecanium pustulans Ckll. (Plate IV, Figs. 5-11.)

Scale of female.—Test of adult female smooth, shining, hard, semi-transparent, flat beneath, convex above; oval in form, one end slightly tapering; color greenish-yellow; around the edge a fringe of long, pinkish-white, glassy filaments. Under the compound microscope the scale shows many glassy filaments all over the dorsal aspect. Average length, exclusive of fringe, about 1 mm.

Mature female.—Globular in outline, about .7 mm. in length; color red; antennæ and legs absent; margin of the body with a row of "figure-of-eight" glands in pairs; segments distinct; the posterior segment furnished with two lobes each bearing one long and two short spines; anal ring small with six hairs; mouth parts rather small, but well chitinated.

First larval stage.—Elongate oval, gradually tapering toward posterior extremity, flat; segments distinct; color red; mouth parts very large, rostral loop long; antennæ apparently 10-segmented, the last segment bearing long hairs: .08 mm. long, formulæ, 10, 2, 1, 6 (4, 7, 8) 9, 5, 3, 9; legs subequal, normal, tibia shorter than tarsus, digitules on tarsus fine, hair-like, knobbed, digitules on claw stout and short; posterior end of the body with two lobes, each bearing one long and two short hairs; anal ring bearing six hairs; length of body, .2 mm.

Pupa.—Length, .9 mm.; width, .4 mm.; reddish brown, antennæ and legs pale, antennæ long, reaching to the base of the second legs; wing-case large, reaching to the base of last leg; legs normal.

Habitat: On *Townefortia pubescens* (119), Iguana Cove, Albemarle Island.

"Quite the same as *A. pustulans*, and evidently introduced by man. The antennæ are not really 10-segmented; the apparent segments are rings; compare certain Aphids and Psyllids" (Cockerell).

Lecanium (*Saissetia*) *hemisphæricum* Targ. (Plate IV, Figs. 12-16.)

Mature female.—Length about 2.5 mm.; hemispherical in shape; color light brown. After treatment with KOH, the female becomes transparent with the exception of the margin of the body which is golden-yellow. Under the microscope may be seen many round, rather large pits all over the dorsal aspect; mouth parts small; antennæ 8-segmented, .14 mm. long, terminal segment bearing many long fine hairs, segment 3 longest, segment 1 next, then 8, segment 6 the shortest; the proportional length of antennal segments are as follows:

1	2	3	4	5	6	7	8
16	13	22	14	11	10	7	14
17	15	20	13	11	9	7	14

The three pairs of legs are subequal, strongly chitinized, coxa stout, longer than wide; tarsus shorter than tibia, digitules on tarsus fine and hair-like, knobbed; digitules on claw very large, of dumb-bell shape, and extending beyond claws; margin of the body with fine forked hairs; anal ring small with many hairs; anal plates small but heavily chitinized, bearing a few short hairs.

Habitat: On *Chicocca racemosa* (60), *Psychotria rufipes* (117) Tagus Cove, Albemarle Island and on *Polypodium squamatum* (499), Chatham Island.

"The scale looks like *Seissetia hemisphærica* Targ., and the antennæ and legs are not specially different. I think this is not to be separated from *S. hemisphærica*" (Cockerell).

Lecanium (*Calymnatus*) *hesperidum* L. *pacificum*, var. nov. (Plate V, Figs. 17-22.)

Mature female.—Length 2-3.5 mm.; color pale yellow: elongate oval in form, nearly flat, smooth. Under the microscope after treatment with KOH, the skin shows but very few pits, irregular in size and distribution. Antennæ 7-segmented, about .2 mm. long, segments, 4 longest, 3 next, 5 and 6 subequal and shortest, segment 1 thickest, wider than long, terminal segment bearing many long hairs, formulae, 4, 3, 7, 2, 1 (6, 5). The proportional length of antennal segments are as follows:

	1	2	3	4	5	6	7
1	10	13	15	15	6	6	15
2	8	10	15	14	7	7	15
3	10	10	16	15	7	7	15
4	7	7	16	13	6	7	15
5		10	18	13	6	6	13
7		10	17	13	7	7	13

Margin of the body with forked hairs; each marginal incision has a large spine with a short one on each side; legs subequal, coxa large, longer than wide, trochanter triangular in form and bearing a long hair, femur large, convex on both sides, tibia nearly as large as femur, but slender, tarsus shorter than tibia, claw long and slender, digitules on tarsus long and hair-like, knobbed, digitules on claw stout, knobbed; anal ring small, with many (8?) hairs; anal plate bearing one large and two or more small spines at the posterior extremities.

Habitat: On *Achrostichum caudatum* (959), *Wedelia paludosa* (966), *Hibiscus tiliacens* (961), *Adiantum intermedium* (962), *Trichomanes prierii* (955), *Conostegia lasiopoda* (963), *Polypodium phyllitidis* (965), *Nephrolepis acula* (53), and *Alsophila armata* (964), Cocos Island. On *Psychotria rufipes* (817), Abingdon Island. On *Psychotria rufipes* (865), 1,000 ft., Iguana Cove, Abingdon Island, and on *Gossypium barbadense* (599), Seymour Island.

"This is a *Calymnatus*, very similar to *C. hesperidum*, but smaller than this species ordinarily is. The antennæ agree with *hesperidum*, as also do the legs. The insect is evidently ovoviviparous. The slight fimbriation of the tips of the spines is peculiar. *C. nanus* (Ckll.) from Trinidad, W. I., also has the spines occasionally slightly fimbriate, but it is a smaller species (length 1.5 mm.), and the fourth antennal joint is much shorter. I am by no means sure that the Galapagos insect is not a form of *C. hesperidum*, perhaps produced by climatic conditions" (Cockerell, MS.).

Aspidiotus (Hemibalesia) lataniae Signoret. (Plate V, Figs. 23, 24.)

Scale of adult female.—The scale of the female is circular with the exuviae laterad of the center; the position of the first is indicated by a ripple-like prominence, slightly covered with white cottony wax; the second skin is slightly reddish brown, with remainder of the scale slightly darker; the ventral scale is delicate, white, and adheres to the bark leaving a white spot when the scale is removed; diameter 1.7 mm.

Mature female.—The body of the female is ovate; pale in color, with the last abdominal segment lemon yellow, and presenting the following characters: there are four groups of spinnerets, the anterior laterals vary from five to seven, while the posterior laterals contain six; there is only one pair of lobes, they are very prominent, about as wide as long, notched on each side, and more or less rounded; there are two incisions in the thickening of the body wall laterad of the lobes; plates distinct, forked, about as long as the lobes; two laterad of the lobes, between the first and second spines, and three more between second and third spines; the spines distinct, first pair on the lateral margin of the base of the lobes, the second pair midway between the two incisions, and the third pair just laterad of the last incision.

Scale of male.—The scale of the male is oval in form, very much smaller than the female, but the same in texture; the exuviae is near the center; length, about .8 mm.

Habitat: On *Scalesia hopkinsii* (851), 1,700 ft., Abingdon Island.

Aspidiotus (Chrysomphalus) smilacis Comstock. (Plate V, Figs. 25-26.)

Scale of female.—The scale of the female is circular, or nearly so, slightly convex, with exuviae laterad of the center, shining coal-black in color; the first skin shows no segmentation; length, .43 mm., the second skin oval, about .55 mm., in length; the color of scale grayish brown to dark brown; diameter usually 1.5-2 mm.

Mature female. The body of the female is ovate, lemon yellow in color; the last segment presenting the following characters: there are four pairs of well-developed lobes, the first and second lobes of each with a notch on the lateral margins, the third pair with two notches on the lateral margins, the fourth pair vary in shape, but are usually abruptly narrowed toward their posterior extremities on the lateral margins, and sometimes have notches; there are six thickenings of the body wall on each side of the meson, these are linear, oblong, with the anterior ends rounded and much expanded, and nearly parallel with the meson, one arising from the mesal margin of the first lobe is short and small, one from the lateral margin of the same lobe is more than twice the length of the lobe, one from the mesal margin of each of the second and third lobes is short and small, one from a point about midway between the second and third lobes extends anteriorly beyond any of the other thickenings, and finally one from the lateral margin of the third pair and one from the mesal margin of the fourth pair, are short and very small, between the members of the first pair of lobes and on each side between the first and second, and second and third lobes are two minute fringed plates, while the space between the third and fourth lobes is wide, with two rather large flat, fringed plates; the spines are very small, and are situated near the middle of the base of the lobes.

Scale of male.—The scale of the male is elongated oval, of the same general color as the female; ventral scale well developed and dark brown, about 1 mm., long.

Habitat: On *Croton scouleri* var. *albescens* (292), *C. scouleri* var. *macraei* (189) 4,000 ft., and *Chusques* sp., Tagus Cove, Albemarle Island; and on *Scalesia gummifera* (266), Elizabeth Bay, Albemarle Island.

“This is a *Chrysomphalus* presenting the closest possible relation to *C. smilacis* (Comstock) which I have not seen. *C. smilacis* was found at Wood's Holl, but I suspect it was on indoor plants. This species differs from *smilacis* in the form of the second and third lobes” (Cockerell).

EXPLANATION OF PLATES.

PLATE IV.

Ortheria galapagoensis, sp. nov.

Fig. 1. Antennæ of female.

“ 2. Leg of same.

Fig. 3. Claw of the same.

“ 4. Anal ring of the same.

Astero'ecanium pustulans (Ckll.).

- g. 5. Last abdominal segment. Fig. 10. Last abdominal segment of the
 " 6. Marginal pits of the same. same.
 " 7. Ventral aspect of first stage. " 11. Pupa ♂.
 " 8. Antenna of the same.

Lecanium hemisphæricum Targ.

- Fig. 12. Antenna of the female. Fig. 15. Marginal spines of the same.
 " 13. Posterior margin of the female. " 16. Leg of the same; *a*, claw.
 " 14. Pits of the same

PLATE V.

Lecanium hesperidum L. var. *pacificum*, var. nov.

- Fig. 17. Ventral aspect of female. Fig. 20. Spines of the anterior incision.
 " 18. Antenna of the same. " 21. Anal plate of the same.
 " 19. Marginal spines of the same. " 22. Leg of the same; *a*, claw.

Aspidiotus lataniae Sign.

- Fig. 23. Female; *a*, antenna of same. Fig. 24. Ventral aspect of the last abdominal segment of the female.

Aspidiotus smilacis Comst.

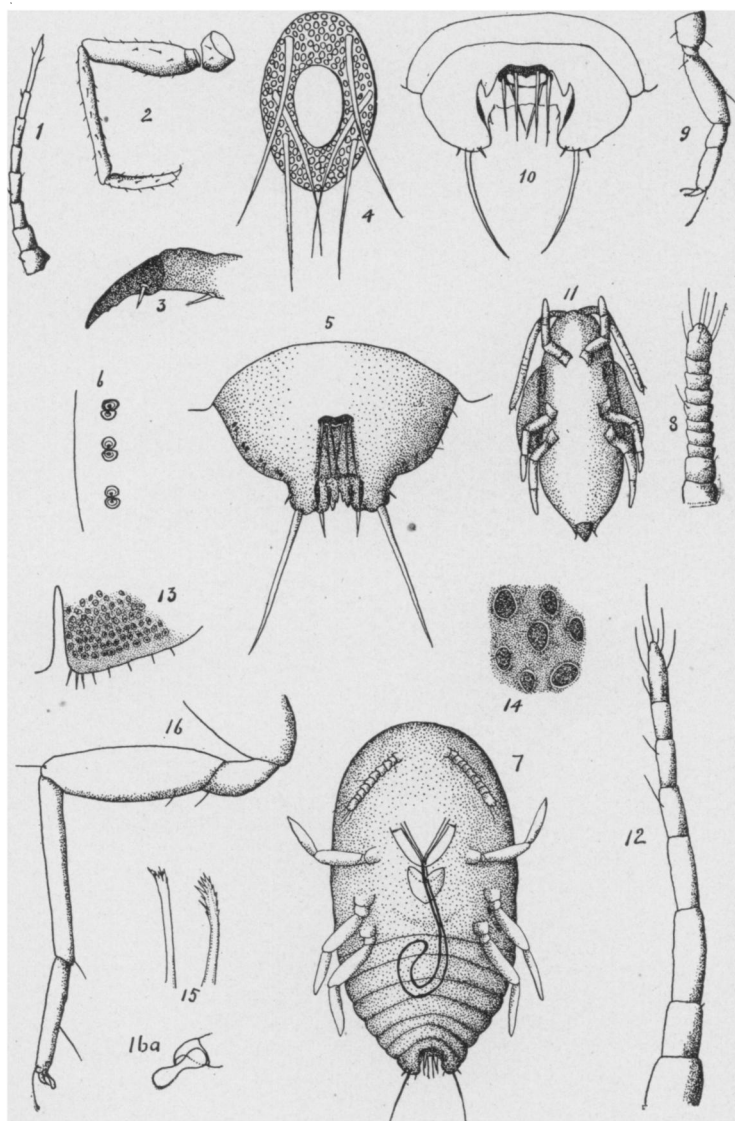
- Fig. 25. Female. Fig. 26. *a*, *b*, ventral aspect of the last abdominal segment of the female.

NEW SPECIES OF NOCTUIDÆ FOR 1902.

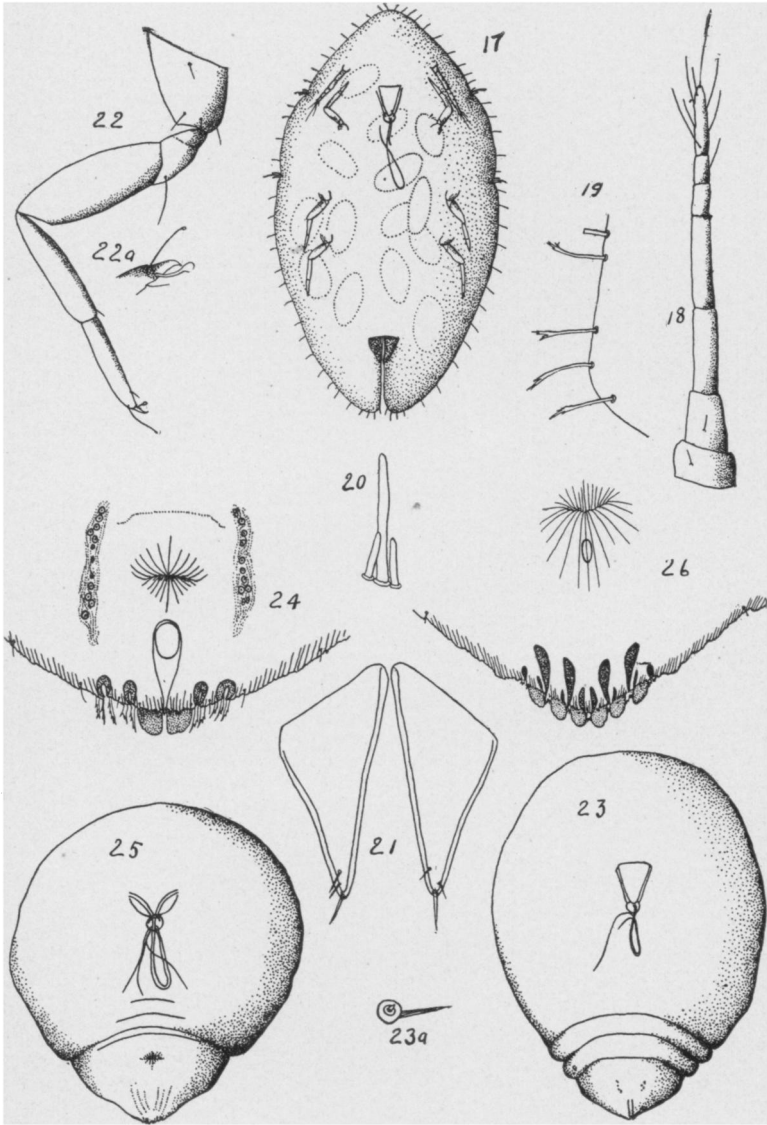
BY JOHN B. SMITH, SC.D.

This is the first of a series of descriptive papers based upon material that has accumulated in my collection or has been sent in by correspondents. As the drawers are rearranged from time to time the doubtful specimens are separated out until such period as further accessions definitely determine their status. Then descriptions are made as time allows and of those that are presented here, some were written five or six months ago.

It has not been until within very recent times that entomologists have appreciated fully the importance of accurate data concerning localities and dates of captures, and of good series of "common" species from all sections. Perhaps nowhere more clearly than in the Noctuids can formative species be studied when sufficient material is at hand. Species that have been in the past accepted as identical with European forms have shown, on closer study, divergencies that



Coccidæ from Galapagos Islands.



Coccidæ from Galapagos Islands.